

WHAT IS CLAIMED IS:

- 5 1. A process for making a self-dispersing pigment comprising the step of oxidizing the pigment with ozone in an aqueous environment while simultaneously subjecting the pigment to at least one dispersive mixing operation.
2. The process of claim 1, wherein the pigment is present in an amount of up to 50% by weight.
- 10 3. The process of claim 2, wherein the pigment is present in an amount of 5 to 20% by weight.
4. The process of claim 1, wherein the aqueous environment includes hydrogen peroxide.
- 15 5. The process of claim 1, wherein the ozone comprises 1 to 20% by weight ozone in a carrier gas.
6. The process of claim 5 wherein the ozone comprises 6% by weight ozone in oxygen.
7. The process of claim 1, wherein the pigment is carbon black.
8. The process of claim 1 wherein the pigment is an organic colored pigment.
- 20 9. The process of claim 1, wherein the process further includes a pre-mixing operation.
10. The process of claim 9, wherein the pre-mixing operation comprises agitating the mixture in a high speed dispersing apparatus.
11. The process of claim 1, wherein the process is carried out at a pH of 6 to 8.

12. The process of claim 1, wherein the aqueous environment being an aqueous medium and ozone are mixed together prior to introduction of the pigment.
13. The process of claim 12, wherein the pigment is not introduced to the aqueous medium/ozone mixture all at once.
- 5 14. The process of claim 1, wherein the self-dispersing pigment has an acid value of less than 3  $\mu\text{moles}/\text{M}^2$ .
15. The process of claim 1, wherein the dispersive mixing operation comprises media milling and passing the mixture through a plurality of nozzles within a liquid jet interaction chamber at a liquid pressure of at least 1000 psi.
- 10 16. The process of claim 1, further comprising the step of purifying the self-dispersing pigment.
17. A process of making a self-dispersing pigment comprising the step of oxidizing the pigment with ozone in an aqueous medium while maintaining a pH of 6 to 8.
- 15 18. The process of claim 17, wherein the pH is maintained by addition of a base.
19. The process of claim 18, wherein the base is selected from the group consisting of potassium hydroxide and sodium hydroxide.
20. The process of claim 17, wherein the pigment is present in an amount of 5 to 20% by weight.
- 20 21. The process of claim 17, wherein the aqueous medium includes hydrogen peroxide.
22. The process of claim 17, wherein the ozone comprises 6% by weight ozone in oxygen.
23. The process of claim 17, wherein the pigment is carbon black.

24. The process of claim 17, wherein the pigment is an organic colored pigment.
25. The process of claim 17, wherein the process further comprises subjecting the mixture of ozone, pigment and aqueous medium to a pre-mixing operation which comprises agitating the mixture in a high speed dispersing apparatus.
26. The process of claim 17, wherein the aqueous medium and ozone are mixed together prior to introduction of the pigment.
27. The process of claim 17, wherein the pigment is not introduced to the aqueous medium/ozone mixture all at once.
28. The process of claim 17, wherein the process further comprises a dispersive mixing operation which comprises subjecting the mixture of ozone, pigment and aqueous medium to an operation selected from the groups consisting of media milling and passing the mixture through a plurality of nozzles within a liquid jet interaction chamber at a liquid pressure of at least 1000 psi.
29. The process of claim 17, wherein the self-dispersing pigment has an acid value of less than 3  $\mu\text{moles}/\text{M}^2$ .
30. The process of claim 17, further comprising the step of purifying the self-dispersing pigment.
31. A process for making a self-dispersing pigment comprising the step of oxidizing the pigment with ozone in an aqueous medium to produce a pigment having an acid value of less than 3  $\mu\text{moles}/\text{M}^2$ .
32. A self-dispersing pigment prepared according to the process of claim 1.
33. A self-dispersing pigment prepared according to the process of claim 17.
34. A self-dispersing pigment prepared according to the process of claim 31.

35. An ink jet ink composition comprising an aqueous vehicle and a colorant, wherein the colorant comprises a self-dispersing pigment according to claim 32.
- 5 36. The ink composition of claim 35, further comprising at least one additive selected from the group consisting of surfactants, humectants, biocides, sequestering agents, viscosity modifiers, and polymeric binders.
37. An ink jet ink composition comprising an aqueous vehicle and a colorant, wherein the colorant comprises a self-dispersing pigment prepared according to claim 33.
- 10 38. The ink composition of claim 37, further comprising at least one additive selected from the group consisting of surfactants, humectants, biocides, sequestering agents, viscosity modifiers, and polymeric binders.
39. An ink jet ink composition comprising an aqueous vehicle and a colorant, wherein the colorant comprises a self-dispersing pigment according to claim 15 34.
40. The ink composition of claim 39, further comprising at least one additive selected from the group consisting of surfactants, humectants, biocides, sequestering agents, viscosity modifiers, and polymeric binders.
- 20 41. An ink concentrate composition comprising an aqueous vehicle and a colorant wherein the colorant comprises a self dispersing pigment according to claim 32 wherein the pigment has a mean particle size of less than 0.2 microns and has a charge density measured by zeta potential lower than -50 mv.
- 25 42. An ink concentrate composition comprising an aqueous vehicle and a colorant wherein the colorant comprises a self dispersing pigment according

to claim 32 wherein the pigment has has a conductivity of less than 0.15 S/m (Seimen/meter) and counter ions of less than 0.15 moles per liter.

1.0220 492360